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ABSTRACT

Childhood obesity remains a significant public health issue. As lifestyle behaviours and weight are established early and track through life stages, prevention strategies must commence in the first years of life. Traditionally, such strategies target parents or formal childcare providers. Yet, grandparents are increasingly providing care to grandchildren and therefore play a key role in their eating and activity behaviours; a major research gap. This commentary piece, focusing on the Australian context, argues that it is imperative and timely for obesity prevention research to include investigations regarding the role of grandparents in the prevention of obesity-related behaviours in young children.

INTRODUCTION

Childhood obesity in children under 5 years is a significant public health concern with considerable health consequences including an increased risk of cardiovascular disease and type 2 diabetes[1, 2]. Internationally, childhood obesity rates are continuing to rise in some countries (e.g. China, Canada), whilst plateauing in others (e.g. United States, Australia)[3]. Nonetheless, they remain high globally[4], with an estimated 41 million children under 5 years of age overweight or obese in 2014[5]. Strong evidence exists that once obesity is established in childhood, it is difficult to reverse, and persists into adulthood[2]. Thus, primary prevention strategies are essential to reduce the rates of childhood obesity worldwide.

Over the past few decades, the evidence base for childhood obesity prevention has been accumulating. School and community-based interventions have been effective in primary school-aged children[6-8], however the evidence for prevention in young children aged 0 - 5 years is still emerging[8, 9]. Intervening in the first years of life to establish healthy lifestyle behaviours is crucial as food preferences[10, 11] and activity behaviours[12] are established at this time and track into adulthood[13]. As such, the World Health Organisation Commission on Ending Childhood Obesity has a particular focus on obesity prevention initiatives that target early childhood[14].

To date, obesity prevention strategies in children under 5 years have typically targeted parents, as they are the “agents of change” for children’s physical activity and nutrition behaviours[15, 16], and the home environment, as well as other settings where children spend

a significant portion of their time such as long day care centres (i.e., formal child care settings)[9, 17, 18]. However, informal care providers such as baby-sitters, nannies, friends, and family members are increasingly providing significant amounts of care to young children. In particular, grandparents are an important source of child care worldwide, providing care to approximately one-quarter of children in the US[19], UK[20], and Australia[21], with the prevalence highest among children under 5 years. Although child care type may not be associated with child weight status per se[22], the nutrition and physical activity environments within these settings can impact on children's health outcomes. Grandparents could therefore play a potential role in the prevention of obesity-related diet and activity behaviours in young children.

THE CURRENT AUSTRALIAN PERSPECTIVE

In Australia, 1 in 5 children are already overweight or obese by the time they start school[23]. In the past decade, obesity prevention trials in 0-5 year olds have been undertaken to address this issue, with a large focus on the first two years after birth[24-28]. However, of these high quality randomised controlled trials, all have targeted the parents and the home environment. Yet, changes in the Australian workforce have transformed the use of child care[29]. Over the last 30 years the presence of women in the labour market has risen by 18%[30, 31] and in families where the youngest child is 0-4 years, 51% and 28% of mothers in coupled and single families, respectively, are employed in some capacity[29]. This increases the need for childcare. Low availability and/or high cost of formal care[32] has subsequently resulted in a rise in the number of young Australian children being cared for by informal

carers such as grandparents. Data from 2011 indicate that of young Australian children aged birth to 4 years who regularly attend some type of child care, one in two (50%) are cared for by a grandparent[33]. Importantly, children aged birth to 4 years spent more time in care by grandparents (10hrs/week) than older children aged 5-12 years (6hrs/week)[33]. With half of Australian children under 5 years of age regularly cared for by a grandparent[33], for an average of 19 hours per week[32], grandparents represent a significant source of informal care provision for young children.

GRANDPARENTS ROLE IN YOUNG CHILDREN'S OBESITY-RELATED BEHAVIOURS

Given that children's food preferences[10, 11] and activity behaviours[12, 34] are extremely malleable in the early years of life and influence future behaviours[13], grandparents who care for children under 5 years of age may play a role in the development of their food preferences and activity behaviours. Previous research in children, including those aged under 5, has shown that some grandparents may unintentionally use unhelpful feeding practices, such as: using food to regulate emotions[35]; restricting access to certain foods[35]; spoiling or treating their grandchildren with food[36-40]; using food as a reward[39, 41]; pressuring grandchildren to eat more[37, 42]; making high-fat and high-sugar foods available[43]; allowing grandchildren a high degree of input and control when planning mealtimes and food choices[35, 37, 44]; and providing less encouragement of a balanced intake than parents[35, 36]. Various reasons have been identified for such behaviour, such as to differentiate their role from that of other carers and parents[39], to demonstrate love and care[36, 45], or to exercise power over the parents[39]. These practices by parents are known to be associated with

maladaptive eating patterns in young children and can increase the risk of childhood obesity[46]. Whether this same relationship exists for grandparents requires further exploration. Grandparents may also influence children's physical development through their own activity behaviours and environment[38], an area for further exploration. Although the amount of time grandparents spent with children was not accounted for in a recent review on links between grandparents and child health, findings showed a negative effect of grandparent involvement (which varied from full-time carers who live in the child's home to part-time carers) on children's (aged 0-18 years) weight status[47]. This suggests that grandparents may be an appropriate intervention target.

GRANDPARENTAL ROLE IN THE FEEDING RELATIONSHIP AND FAMILY DYNAMICS

Societal changes, including an increase in the proportion of mothers of young children in the paid workforce in recent decades [48, 49], has led to changed family roles and an increased reliance on child care. As parents are increasingly struggling to find formal child care centres with a suitable location, price, quality, and availability[32], many are turning to informal care, in particular grandparents, to meet their child care needs[33]. Many parents now rely on grandparents for the provision of care to their young children, and significantly value their contribution. However, there is evidence that some parents feel their efforts to undertake positive child feeding practices, such as repeated exposure to a range of flavours and textures and responsiveness to infant cues of hunger and satiety[50], are often undermined by grandparents[37-39]. Given that the current food and activity environments of children are different from prior generations [51, 52], feeding children and adhering to recommendations

regarding physical activity are often mentioned as sources of conflict between parents and grandparents[36, 53]. Studies have reported that conflict and tensions between caregivers may arise due to: different food rules or practices[37, 39]; different definitions of healthy eating[38]; and parents' beliefs about grandparents undermining their authority and disregarding their rules[39]. Similarly, grandparents' fear of interfering and undermining parents may result in ambivalence about getting involved with any aspect of child rearing[54]. The need for grandparents to carefully manage familial relations, particularly with parents, has been expressed previously[45, 55] and thus supporting grandparents, as well as parents, with the skills to foster good inter-generational relationships, could be beneficial for child health[54].

THE NEED TO SUPPORT GRANDPARENTS IN THEIR ROLE AS CARERS OF YOUNG CHILDREN

Considering the significant number of children being cared for regularly by a grandparent in Australia and internationally, and the significant role they can play in influencing the eating and activity behaviours of young children, supporting grandparents in caring for young children may help to improve their eating and activity behaviours. However, in Australia informal child care provided by grandparents is currently largely unsupported[56]. In comparison, formal child care (i.e., Long Day Child Care and Family Day Care) is regulated and receives Government funding and support[57] to foster healthy lifestyle behaviours in young children. Thus, support programs or initiatives for grandparents would complement other established activities in formal care environments to promote healthy lifestyle behaviours in young children. In addition, research has shown that grandparents who are responsible for providing significant care for grandchildren often experience social

isolation[58] amongst other considerable sacrifices[59]. Social support for grandparents who care for grandchildren may minimise any negative impacts on grandparents' well-being[60] and even be protective against childhood obesity[61]. Thus, a program or initiative that focuses on social support and recognises and supports the significant contribution that grandparents provide to the care of young children could benefit both generations.

SUPPORTING GRANDPARENTS IN THEIR ROLE AS CARERS OF YOUNG CHILDREN*:* THE EVIDENCE GAPS

To date, healthy lifestyle programs for children have generally been delivered to parents only[62, 63]. However, recent research has recognised the importance of involving grandparents in support initiatives[54]. Yet, such interventions are sparse, and those that do exist predominately focus on custodial grandparents[64-66] or on assisting part-time grandparents to manage challenging child behaviour[67]. For example, a nine-week parenting program targeted at Australian grandparents, '*Grandparent Triple P*,' found an immediate, short term improvement on child (mean age 4.4 years) behaviour, grandparent anxiety and depression, and on the grandparent-parent relationship[67]. Evidence-based Parenting Programs (EBPP) such as this, which are designed to support grandparents on, for example, helping grandchildren develop, building a positive parenting team and planning ahead[67], yet also have positive impacts on the parents and grandchildren, have the potential to inform healthy lifestyle programs. Research internationally has shown that intergenerational interventions can also improve children's lifestyle behaviours[68] and grandparents' health and wellbeing[66]. For example, Werner, Teufel et al.[68] reported that upon completion of the

US 'Active Generations' program, a short term intergenerational, childhood obesity prevention intervention, children (n=760, mean age 9 years) had significantly increased their intake of fruit and vegetables, were more confident in participating in physical activity, and participated in less screen time. To our knowledge, there is no similar work being conducted with grandparents of young Australian children with a focus on healthy lifestyle behaviours.

IMPLICATIONS FOR RESEARCH AND PRACTICE

As a result of changing social and financial environments, parents are utilising alternative child care arrangements for their children, often relying on grandparents. From this emerges an increased interest in understanding how to support grandparents and promote health and well-being in children, grandparents and parents. To date, very little research has explored the role of grandparents and their needs in fostering healthy lifestyle behaviours in young children in cases where grandparents provide informal, temporary care. There is subsequently an opportunity to create tailored, evidence-based healthy lifestyle interventions for grandparents. Such interventions should have a strong theoretical underpinning to enhance program effectiveness [69, 70]. Selection of the most appropriate theory (or theories) on which to build an intervention is important, with Davis et al. identifying 82 theories of potential use in designing and evaluating public health interventions[69]. Commonly applied theories to date include Social Cognitive Theory (SCT), the Transtheoretical Model of Change (TTM), the theory of planned behaviour (TPB) and the Information-Motivation-Behavioural-Skills Model[69], accounting for nearly two-thirds of the articles identified in the review [69]. However, frequency of use does not necessarily correlate with theory quality and thus awareness of the many other theories available on which to

design an intervention is important [69]. Other theories not appraised in this review [69] such as parenting styles theory[71, 72] and family-systems theory[73] may also be appropriate. Lastly, use of the Behaviour Change Wheel (BCW) [74] should be considered in intervention development, as is being done in related fields of research.[75] The BCW is a theory- and evidence-based tool which draws on a range of theoretical approaches to address the target behaviour of interest and has the potential to lead to more effective interventions [74].

Including grandparents in interventions will help to provide consistency in parenting and create supportive and health-promoting environments for children[67] whilst also providing benefits across generations[65]. It would open up a dialogue where parents and grandparents can safely discuss expectations and resolve conflict in a mediated environment[54]. However, including grandparents in interventions with parents/families, rather than on their own, may be challenged by logistical factors and generational differences. For example, finding a common available time for intervention delivery becomes increasingly difficult with increasing number of family members[76], whilst older generations of grandparents may be less receptive to technology-based interventions than younger generations of grandparents and/or parents. In addition, recruitment of multi-generational families into trials may be difficult as a one-size-fits-all approach may not be appropriate[77], leading to increases in resources required for recruitment. Thus, consideration must be given to whether interventions ought to be intergenerational or targeted solely at grandparents.

However, findings from the limited research conducted with grandparents indicates that grandparents may be receptive to support programs, with Kirby and Sanders[67] reporting high program satisfaction amongst grandparents, supporting the possible transfer of these

methods to more specific healthy lifestyle-based interventions. However, future programs must be mindful of the capacity and needs of the target population. Understanding the needs of grandparents caring for young children in regards to the type of support desired, will allow researchers to develop support programs or initiatives that are desired and therefore utilised. Populations with greater needs, such as custodial grandparents or grandparents of a child(ren) with special needs, may benefit from 'higher intensity' group-based EBPP. In contrast, lower risk populations may benefit more from 'lighter touch' interventions such as social support groups, self-directed programs or education seminars[54]. Modular-designed interventions[78] that are comprised of sub-units that can be implemented independently or together may be suitable, due to potentially different needs and capacity among grandparents. Particular modules may focus on improving grandparent-parent communication[55] to help alleviate tensions that may arise between generations when it comes to the provision of food and the activity environment whilst others may build on parenting skills to create a positive eating and activity environment[79]. Further, involving grandparents in the design of such interventions from the outset and building an ongoing collaborative approach between researchers and end-users could lead to successful outcomes[80].

Understanding the needs of grandparents' would also enhance program effectiveness and could therefore lead to community-wide roll-out with appropriate Government support. It would also provide evidence for researchers and relevant agencies to lobby for government policy that better supports grandparents caring for young grandchildren. This may include policies that support the development of accessible playgrounds/play areas and a reduction in accessible fast food outlets, to facilitate healthy eating and activity behaviours in young

children. It could also lead to the development of targeted wide-reach social marketing campaigns[39]. Such campaigns could highlight the vitality of grandparents in today's society, show appreciation for their efforts and of the impact caring has on their own lives, and to build self-esteem and social capital[33]. However, further research is required to inform such initiatives.

CONCLUSION

Overall, grandparents are increasingly playing a key role in the eating and activity behaviours of young children and are an important group that to date has been overlooked in efforts to reduce child obesity. Thus, initiatives that promote healthy lifestyle behaviours in young children should include grandparents. Carefully designed programs that focus on the needs of both the child and grandparent have the potential to support the development of healthy food preferences, eating habits, and activity behaviours in children and to provide a social support network to promote positive well-being in grandparents. As such, it is imperative and timely for obesity prevention research to focus on the role of grandparents in the development of healthy lifestyle behaviours in the young children to whom they provide care. Doing so could be a significant and innovative child obesity prevention strategy.

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